REPORT RESUMES

ED 013 715 24 RE 000 317

TRANSFER EFFECTS OF TRAINING INTERMEDIATE GRADE PUPILS TO ADJUST READING SPEED TO READING PURPOSE.

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REPORT NUMBER CRP-3137 PUB DATE 66
REPORT NUMBER BR-5-0579
EDRS PRICE MF-$0.50 HC-$3.72 93P.

DESCRIPTORS- *READING RESEARCH, *READING SPEED, *READING SKILLS, *TRANSFER OF TRAINING, INTERMEDIATE GRADES, UNIVERSITY OF WISCONSIN, LABORATORY FOR RESEARCH IN BASIC SKILLS

AN INVESTIGATION WAS CONDUCTED TO DETERMINE WHETHER READING RATE VARIABILITY DEVELOPED WITH SHORT, TIGHTLY-CONSTRUCTED TRAINING MATERIALS WOULD TRANSFER TO LONGER, MORE SCHOOL-LIKE PASSAGES IMMEDIATELY AFTER TRAINING AND ONE MONTH LATER. THE PROJECT WAS AN EXTENSION OF THE USOE PROJECT 1755, "THE EXPERIMENTAL DEVELOPMENT OF VARIABILITY IN RATE OF READING IN THE INTERMEDIATE GRADES." THE SUBJECTS WERE 72 CHILDREN IN MADISON, WISCONSIN--12 GIRLS AND 12 BOYS IN EACH OF GRADES FOUR, FIVE, AND SIX--WITH READING SCORES BETWEEN THE 40TH AND 90TH PERCENTILES ON THE SEQUENTIAL TESTS OF EDUCATIONAL PROGRESS, THE CALIFORNIA ACHIEVEMENT TEST, AND THE IOWA READING TEST. DURING THE ORIENTATION AND TRAINING PERIODS, GROUP 1 WORKED WITH MATERIALS FROM WHICH THE MAIN IDEA WAS DELETED. BOTH GROUPS WORKED WITH PASSAGES OF IDENTICAL LENGTH AND ESSENTIALLY THE SAME SUBJECT MATTER. NEITHER TRAINING METHOD, SEX, NOR GRADE WAS SIGNIFICANTLY RELATED TO READING RATE VARIABILITY AS DEFINED AND MEASURED. HOWEVER, DATA INDICATED THAT ANY READING RATE VARIABILITY EXISTING AFTER TRAINING WAS TRANSFERRED AND THAT FLEXIBILITY COULD BE TAUGHT IN FOURTH GRADE. SAMPLES OF TRAINING MATERIALS, EXAMINERS' DIRECTIONS, ORIENTATION MATERIALS, TABLES FIGURES, AND REFERENCES ARE INCLUDED. TRAINING PROCEDURES AND MATERIALS ARE DESCRIBED. (RH)

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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1966

Laboratory for Research in Basic Skills
School of Education
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The research reported herein was supported by the Cooperative Research Program of the Office of Education, U. S. Department of Health, Education, and Welfare.

ACKNOWLEDGMENTS

We are indebted to the Madison Public Schools and in particular to Mr. H. Ralph Allen, Principal of Randall School, Madison, Wisconsin, for his willingness to make implementation of this study possible. Mr. Allen and his staff were most helpful.

Research assistants Jenny Armstrong, Bob Jerrolds, Marilyn Koepke, Karl Koenke and Susy Tatham ably assisted in all phases of the study, the data analysis and preparation of the final report. Jane Brousseau and Diane Davis were responsible for many of the arrangements for the testing program and for the preparation of materials and this report.

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TRANSFER EFFECTS OF TRAINING INTERMEDIATE GRADE PUPILS TO ADJUST READING SPEED TO READING PURPOSE

I. INTRODUCTION

The Committee for Research in Basic Skills has spent a number of years investigating problems of teaching and learning fundamental skills in the elementary grades. Generally, the Committee has chosen to be extensive in its approach, investigating many dimensions of a given problem. As a result, there have been series of studies within broad problem areas.

The present investigation grew out of a recurring concern for pupils' development of flexibility in performance in the basic skill areas. In a project entitled "The Perception of Symbols in Skill Learning," Herrick, Harris and Rarick (4) established the importance of the development of variability rather than rigidity in motor-speed sets in handwriting. The authors pointed out that their findings might well have implications for other areas of skills development. The question of flexibility arose again in two studies (Harris and Rarick, [3]; Herrick and Otto, [5]) of the handwriting act. One implication of these studies was that efficiency in a skill such as handwriting does not seem to be associated with the development of a fixed level of pressure but rather with the ability to control pressure within given limits. Another study by Otto (6) indicated that among good readers in the elementary grades responsiveness to auditory, visual, kinesthetic and combined presentations of stimuli varies according to grade level and type of reinforcement. The variance, however, was not always in the direction expected, which suggests that one effect of the instructional program may be the development of perceptual sets in reading.

These studies led the Committee to U. S. Office of Education Project No. 1755, "The Experimental Development of Variability in Rate of Reading in the Intermediate Grades" (2). The results of the study showed that fourth grade good readers who received a two-week training program developed the ability to vary their speed when reading for different purposes. In the training program the children were given (a) a brief introduction to three types of reading purposes--reading for the main idea, reading to find a specific fact, and reading to follow the sequence of ideas, (b) short testing and training passages carefully constructed as to unity, coherence, emphasis, and appropriate content and difficulty level, (c) separate selections for narrative and expository style, and (d) testing to a criterion of full comprehension of each specified purpose. Specifically, the children were shown to: (a) possess a hitherto unreported ability to adjust significantly their reading speeds very quickly to their purposes for reading; (b) alter significantly their pattern of reading speed relative to reading purposes and to maintain a significant spread in speed-purpose variability while increasing their reading speeds for each purpose approximately 40 per cent, with further gains upon retention tests two weeks after training; (c) adjust their reading speeds to reading purposes significantly differently according to passage style and to a certain extent according to sex; (d) and display the greatest improvement in reading for the main idea and specific fact. The results of Project 1755 also showed that (a) children of comparable reading ability in the fifth and sixth grades have no more variability or spread in their reading speeds according to reading purposes than do fourth graders; (b) children, by their own daily ratings, greatly enjoyed the two-week training period which was largely self-instructional in nature; (c) during the short training period, children became significantly more realistic in predicting their reading speeds when asked to read for sequence of ideas, but not for main idea or specific fact; and (d) no untoward evidences of tension were found to be associated with reading the test passages or answering questions on them.

In keeping with its past policies, the Committee sought to relate its research tasks directly to specific aspects of school practice in order to provide a basis for generalizing its findings to school programs. The experimenters felt that before schools could be expected to implement the findings of Project 1755 in their programs, they should have empirical evidence that the results of training given under the aforesaid experimental conditions would indeed transfer to more typical reading tasks faced by intermediate grade children. The present study is, therefore, an extension of Project 1755 and is specifically designed to investigate the possibilities of such transfer effects.

The first part of the present study replicated the training and testing of Project 1755, with the exception of the substitution of a second active learning group for a passive control group. Since the preceding study gave evidence that trained groups achieved greater variability than controls, it was felt to be more pertinent to test for significant differences between types of training. Therefore, half of the subjects were trained with passages containing an explicitly stated main idea and the other half worked with passages in which a main idea was implicit but not stated. Classroom materials may or may not contain explicit main idea statements so the intent was to determine whether training with either type would produce better results.

The general hypothesis of the study was: Children in Grades 4, 5 and 6, trained to adjust their reading speeds to three reading purposes (Main Idea, Specific Fact and Sequence of Ideas) upon short, highly structured paragraphs containing either explicitly stated or implicit main ideas as a training condition, will successfully transfer this skill to longer and less structured passages typical of elementary classroom materials.

Answers to the following questions were sought:

1. Do boys and girls in grades 4, 5 and 6, trained on passages containing either explicitly stated or implicit main ideas, differ in their reading rate variability when reading either expository or narrative materials for three different purposes on (a) a training-like task immediately after training? (b) a transfer task immediately after training? (c) a transfer task one month after training?

2. Do boys and girls in grades 4, 5 and 6, trained on passages containing either explicitly stated or implicit main ideas, differ across testing occasions in their reading rate variability for three different purposes when reading either expository or narrative materials?

3. Do children differ in their mean reading time when reading either narrative or expository material for three different purposes?

II. METHOD

Subjects

In the final analyses, 72 children from grades 4, 5 and 6 of a middle class elementary school in Madison, Wisconsin served as subjects. There were 24 subjects at each grade level, 12 boys and 12 girls. In an attempt to exclude the extremes of reading ability, subjects were chosen who had standardized reading test scores that placed them between the 40th and 90th percentiles for their grades. The STEP Reading Test was used in Grade 4, the Reading Comprehension Subtest of the California Achievement Test was used in grade 5, and the Iowa Reading Test was used in grade 6. School personnel corroborated the reading test scores. Table I shows the percentile range by grade and sex.

TABLE I

PERCENTILE RANGE OF SUBJECTS' READING TEST SCORES BY GRADE AND SEX

Sex	Grade					
	Fourth		Fifth		Sixth	
	Percentiles		Percentiles		Percentiles	
	Lowest	Highest	Lowest	Highest	Lowest	Highest
Boys	48	88	62	90	40	87
Girls	50	90	54	90	57	89

Within sex and grade level, equal numbers of subjects were randomly assigned to the two treatment groups. To guard against attrition due to absence, inability to cope with the task, and examiner errors, extra subjects, 1 boy and 1 girl from each grade level, were included in each treatment group. Therefore, the treatment groups comprised 42 children, of whom 6 were not included in the analysis. The extra subjects remaining after attrition were randomly dropped.

Experimental Treatments

The distinction between groups was (1) in the nature of orientation to reading for the main idea and (2) in the structure of materials read during the orientation and training periods. During these periods, Group I worked with materials in which a main idea was explicitly stated, the task in reading for the main idea being to identify the main idea from a list of sentences taken from the passages read. Group II worked with the materials from which the stated main idea had been deleted, the task in reading for the main idea being to formulate a main idea and then select the main idea sentence from a list identical to the one used by Group I. Both groups worked with passages of identical length and essentially the same substantive subject matter. See Appendix A for differential directions used during the Orientation and Training periods.

Materials

Materials for orientation to the task, for variability training and for immediate post training evaluation were taken, with but minor adaptations explained below, from materials constructed for Project 1755. Longer materials, more representative of the type encountered by elementary pupils, were constructed for use in the attempts to assess the immediate and delayed transfer effects of the variability training. The development of materials was a major focus in both the present project and the one that preceded it; thus, the materials are described in considerable detail.

Orientation Materials

The orientation materials comprised three sets of passages, one set for each of the three purposes for reading (see description of the training program). The sets of materials used to orient subjects to the three purposes can be found in Appendix B. Each passage was printed separately on charts which could be read from the location of any pupil in the testing room. A list of five names with corresponding telephone numbers was used in finding a specific fact. Reading for sequence involved one basic paragraph with three different orderings of its five sentences. For Group I orientation to reading for the main idea also employed a basic paragraph which was rewritten three times so that the topic sentence appeared in different parts of the passage. The materials were taken from those developed for Project 1755.

Because all of the Project 1755 materials included explicitly stated main ideas, the following adaptations were required for use with Group II. First, the sentence stating the main idea was deleted from the passage used to orient the subjects to reading for the main idea passage and the remaining sentences were expanded slightly to preserve a uniform length. Second, an additional paragraph was used with Group II during its orientation to the purpose of reading for the main idea. This paragraph was similar to the first one in topic and construction, but it was used to provide further clarification of the task and practice in arriving independently at a conception of the main idea. A pilot study showed that the added practice was needed.

Training Materials

The training materials developed in Project 1755 and used in the present study consisted of three parts; a set of directions, the passages to be read, and comprehension checks. Brief descriptions of each of the three parts of the training materials follow. See Appendix C for examples of the training materials.

Directions. The primary purpose of the directions was to establish a definite purpose for reading either to find the Main Idea, the Sequence of Ideas, or a Specific Fact. Thus, a specific question was asked for each selection to be read for a Specific Fact, and when the purpose was to read for Sequence or Main Idea, the subject was told to read to find the Main Idea or to remember the order of events. The directions were designed to make the training self-instructional.

Passages. The passages were written with the following restrictions and considerations in mind. The content of the training materials was from the areas of social studies, science or fiction because Shores' (9) research indicates that reading speed is affected by different kinds of content.

The passages were written in narrative and expository styles because pupils commonly encounter both styles and because a pilot study in Project 1755 showed that expository materials were read faster than narrative.

Passages with stated main ideas were given either an inductive structure (i. e. the topic sentence came near the end of the selection) or a deductive structure (i. e. the topic sentence came near the beginning of the selection). The decision to consider structure of the material was based upon results of pilot testing in Project 1755 which indicated that children perform better on paragraphs organized deductively than inductively.

Passages were limited to six to eight sentences with a total word count ranging from 66 to 112 words, for the earlier pilot study showed that fourth grade students had much difficulty with longer selections before training.

In an attempt to keep the passages within the fourth grade readability level according to the Dale-Chall formula, the vocabulary was limited to grade 4 word lists, sentence length was limited to a 7-14 word range, and typical subject-verb word order was maintained within the sentences. Each passage was allowed a maximum of two examples of the syntactical complications which follow: relative and subordinate clauses, participial phrases, infinitive phrases separated from the main verb, and inverted subject-verb word order. Five teachers with experience in the intermediate grades judged the difficulty to the materials to be appropriate. As an added check, the directions for each passage encouraged the subjects to ask for vocabulary help as needed.

Each passage had a single main idea. Group I practiced with passages in which a main idea was explicitly stated; Group II practiced with passages in which the same main idea was implied but not stated. In the passages where the main idea was not stated, adjectives, adverbs, and other words which did not change the meaning of the paragraphs were inserted in the remaining sentences to yield a constant paragraph length. The nature of the daily training materials is shown in Table 2.

TABLE 2

NATURE OF THE DAILY TRAINING PROGRAM MATERIALS

4 Main Idea Selections
1 Sequence Selection
1 Specific Fact Selection

Comprehension Tests. The position was taken that the reader should have access to all the passage units when selecting the appropriate main idea or determining the proper order of ideas. Thus, for the main idea and sequence tasks the comprehension tests contained a condensed or abridged restatement of each of the 6 to 8 sentences in the passage itself and the subject either identified the main idea statement or sequentially ordered the statements given. For the specific fact tasks, a phrase containing a specific fact was taken from each sentence and the subject identified the correct one.

Post Training Materials

The directions and comprehension tests used with the post training materials were of the same type as the training materials proper and the passages were likewise adapted from paragraphs constructed for Project 1755. Six of the passages were written without a stated main idea and six were written with an explicit main idea. Each passage was 66 words long, including 5 sentences if the main idea was not stated or 6 sentences if it was stated.

Transfer Materials

Since the central question of the study is whether variability in reading speed developed by training with carefully constructed, short model paragraphs will transfer to reading the longer, less tightly structured passages typically found in classroom material, the decision was made to seek types of material actually employed in classroom instruction for the transfer task. With this decision, there was the problem of learning more about the nature and length of "typical" paragraphs in elementary level materials. A preliminary survey of tradebooks and textbooks, especially basal reading series, revealed a lack of consistency within intermediate level materials and even within individual publications.

It had at first been assumed that construction of the transfer materials would involve the use of a certain number of paragraphs, but the survey revealed that there was a surprising lack of correspondence between paragraphing and topical units. Within a single paragraph, two or three topics might be discussed;

yet at another place in the same material several paragraphs might be used to cover one topic. Since one of the purposes for reading in the study involved the identification of formulation of a main idea, the experimenters decided to select passages that contained only one main idea, regardless of the total number of paragraphs involved. The survey showed also that there was little consistency among the materials with regard to the number of words used in the coverage of a single main idea. Because the experimental design of the study called for a uniform length in the transfer test materials, the experimenters arbitrarily set the length at 198 words, three times the number of words in the post training test materials.

With consideration for all the factors involved in the looseness or tightness of the structure of materials at the intermediate grade levels, the experimenters decided that selections from the intermediate level _Reader's Digest Skill Builders_ were reasonably representative of materials used by children in the fourth, fifth and sixth grades.

Passages were chosen from the _Skill Builders_ in view of the following: each passage had to have a single, complete main idea; each passage had to be appropriately written for one of the three purposes, (i. e. if the purpose were to read for sequence, the passage must obviously contain a clearly recognizable sequential development); and all of the passages chosen had to be generally interesting to intermediate grade children but not specifically familiar to them. The _Skill Builder_ selections were modified only when necessary in terms of the addition or deletion of a stated main idea, and/or the addition or deletion of unimportant words in order to keep the length constant.[1] Half of the selections chosen were written in a primarily narrative style and half were expository in style.

Equivalent sets of materials were necessary for the immediate and delayed transfer testing. "Pairs" of materials were developed by drawing two selections from the same Skill Builder article. Since these articles were very short, it was felt that vocabulary, style and other factors affecting readability were likely to be reasonably equivalent. An example of the equivalent sets appears in Appendix D. The selections in each pair were assigned randomly to the immediate or delayed transfer testing materials.

An analysis of the type of selections and the purposes for which they were read is given in Table 3.

TABLE 3

SELECTION TYPE AND PURPOSES USED IN THE
IMMEDIATE AND DELAYED TRANSFER TASKS

	Selections for Immediate Transfer		Selections for Delayed Transfer	
Stated Main Idea	2[a]	Main Idea	2	Main Idea
	2	Sequence	2	Sequence
	2	Specific Fact	2	Specific Fact
Unstated Main Idea	2	Main Idea	2	Main Idea
	2	Sequence	2	Sequence
	2	Specific Fact	2	Specific Fact

[a] There was one narrative and one expository selection in each pair.

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[1] The authors are indebted to the editors of Reader's Digest for permission to use adaptations of materials from the Reader's Digest Skill Builders and for their examination and approval of all adaptations made in the materials.

Training and Testing Procedure

In keeping with the framework established by Project 1755, the research program was divided into two basic parts, training and testing, which were then subdivided with time designated for each part as shown in Table 4.

TABLE 4

SEQUENCE OF TRAINING AND TESTING

Training Program			Testing Program	
Orientation Period	Training Period	Post-Training Test Period	Immediate Transfer Test Period	Delayed Transfer Test Period
Days 1-3	Days 4-10	Day 11	Days 12-13	Days 14-15 (One month following Days 12-13)

Training Program

Training Examiners. A week before the training program began, the adult assistants met with the graduate research staff for orientation to methods and procedures to be used. A brief history of the research project was given, and each assistant received a copy of the complete set of directions for each day of training. See Appendix A. Objectivity in working with the subjects was emphasized.

Training Subjects. Days 1-3 of the training program served as Orientation Period to prepare subjects to read for the three different purposes and to familiarize them with the materials and procedures. The subjects read three practice passages each day. The orientation sequence is shown in Table 5.

TABLE 5

ORIENTATION SEQUENCE

Day 1	Day 2	Day 3
Introduction to (1) 3 purposes for reading (2) use of stop watches (3) use of Time Record Sheets	Introduction to (1) Conversion tables (2) Graphs	Introduction to predicting reading speed

In the Orientation Period the presentation of reading for the main idea differed between groups. Group I practiced with stated main ideas in their paragraphs while Group II practiced with paragraphs with implicit main ideas. This distinction was maintained throughout the training program. Examples of the differentiated training materials appear in Appendix C.

On days 4-10 the subjects practiced for 30-45 minute periods each day, during which they read six selections daily. The selections were randomly ordered for the total group of 84 subjects every day.

In addition to reading passages, subjects practiced predicting their reading speed for each selection. Then they recorded actual reading time to the nearest second from their stopwatches on Time Record Sheets and prepared individual graphs to record their progress. It was felt that these steps would help each subject evaluate his own progress; for the graph would enable him to visualize the differences in reading rate for each of the three purposes for reading.

On each of the seven practice days, this procedure was followed:

1. Each subject received his set of self-instructional materials and read the directions to establish a purpose for reading.
2. Each subject predicted his reading speed on his graph.
3. Each subject timed his reading of the selection with a stop watch and recorded actual reading time on Time Record Sheets.
4. An answer sheet accompanying the selection read was then completed.
5. Subjects were expected to read to full comprehension or 100 per cent accuracy in responding to the comprehension test items. Due to the nature of the tests, five trials was the maximum. The assistants checked individual responses after each trial.
6. Raw time scores were translated into words per minute scores by the subjects, who were supplied with conversion tables.
7. Subjects then plotted reading speed on their graphs to show a comparison of predicted and actual reading speed. The graphing was intended to serve as a motivational device.

Administration of the Training Program

To obtain manageable groups for the training sessions, Groups I and II were each divided into two training groups of twenty-one subjects. Three groups met separately in the testing room during the morning, and one group met in the afternoon.

Four research assistants conducted the Training Program. Since each had been involved in working on various phases of the training materials and training procedure, it was felt that they would be highly consistent in their administration of the four training groups. Four or five adult assistants were available at each session to supervise the subjects' work. The resulting ratio of one adult for every four of five subjects insured adequate supervision of the work and immediate feedback on the comprehension tests.

The following administrative details were patterned after Project 1755:

1. Training groups were no larger than 21 subjects.
2. A large, well-ventilated, well-lighted, quiet room was used.
3. Individual work space was available for each pupil.
4. All necessary supplies were provided by the researchers.
5. One adult was assigned to work with every 4 or 5 subjects.
6. Instructors and assistants were trained in the testing procedures and to anticipate possible problems.
7. Detailed printed instructions were provided for instructors and assistants.

Testing Program

The procedure followed during the three phases of the Testing Program (see Table 4) deviated from the Training Program in these ways: (1) For the Post-Training Test, Day 11, 12 randomly ordered, 66 word selections were read instead of the usual 6 selections of varying length. Four randomly ordered selections were read for each of the three purposes. The total reading time in seconds for each purpose was recorded. The pupils did not use their graphs. (2) The Immediate and Delayed Transfer selections were 198 words in length. They are described in detail in the materials section of this paper. All subjects read 12 randomly ordered selections, 6 with and 6 without an explicitly stated main idea, for Immediate Transfer on days 12 and 13. One month later, on days 14 and 15, they read 12 selections comprising the second half of the set of transfer materials. During the two transfer testing periods, the assistants recorded the subjects' total reading time in seconds when reading for each purpose. No graphs or conversion tables were used.

The assumption was that in order to assess the effects of the stated and implied main idea treatment conditions it was necessary to test the subjects on materials with and without explicitly stated main ideas. A reasonable expectation would be that subjects trained with stated main ideas would do best on test materials which contained stated main ideas and those trained with materials having implicit main ideas would do best on test materials with implicit main ideas.

Design and Analysis

In order to determine the variability of reading rate for the three different purposes - specific fact, sequence and main idea - a variability score was calculated for each subject. The variability score was derived by using the reading speed of the slowest individual as a base to which other reading speeds were converted. This type of standardized score was designed to meet certain technical difficulties encountered in the use of ratio scores in Project 1755 by providing a common base for determining the proportional variability of individual reading speeds for three different purposes. The variability scores were calculated according to the standard variance formula:

$$S^2 = \sum_{i=1}^{3} \frac{(Xi-\overline{X})^2}{n-1}$$

Xi was the sum of individual scores where i varied across the three purposes; $\overline{X}$ was the mean of the three purpose scores, and n = 3. Thus, the variability scores took into account the subjects' reading rate for one purpose in relation to all purposes (mean rate). The style of the material was also considered in that two rate variability scores were calculated for each subject - one for narrative and one for expository materials. There were three different designs and consequently three different types of analysis.

One design was a 3x2x2 completely crossed analysis of variance design with three grades, two sexes and two training methods and six replicates per cell. The model was assumed to be fixed. The reading variability scores were transformed by using the natural log to base e. Thus, the scores (y) used in the analysis were:

$$y = \text{nat } \log_e \sum_{i=1}^{3} \frac{(X_i-\overline{X})^2}{n-1}$$

After the scores were transformed, an analysis of variance was done on the means of the variances according to the procedure outlined by Scheffé (8) for the comparison of variances. Six analyses were done according to these design and analysis procedures, one analysis for each testing occasion.

The second design was a 3x2x2x3 analysis of variance with three grades, two sexes, two training procedures and three repeated measurements or tests--a training test immediately after training, a transfer task immediately after training and a delayed transfer task one month after training. Since both the immediate transfer and delayed transfer tasks were longer than the post task, the post test scores were standardized to transfer task lengths. The dependent variable for the analyses using this design was post-adjusted rate variability. Two analyses across testing occasions were made using this procedure, one for each style of materials. Conservative F tests using the Greenhouse & Geisser (1) procedure were also used in this analysis. The adjusted degrees of freedom were 1 and 69 respectively. For all F ratios found to be significant post hoc comparisons among the means were done following the procedures of Scheffé (7).

The third design was a subject x purpose one-way analysis of variance design. The dependent variable for the analysis was the proportion of each individual's reading time for each single purpose to his total reading time for all three purposes.

Due to the fact that each subject read for three purposes, a repeated measures situation existed. Greenhouse & Geisser (1) have pointed out that for the usually computed F ratios of mean squares in the regular analysis of variance to be exactly distributed, as the F distribution, it is necessary that the columns or tests in addition to being normally distributed, having equal variances, should be mutually independent. Since the measures were made on the same subjects, the independence assumption could not be met.

Although one approach to this problem would be to use a multivariate analysis of variance design, a simpler approach is to follow the procedure of adjusting the degrees of freedom which results in conservative F ratios which approximate the F distribution when the independence assumption is not met (1). The adjusted degrees of freedom are in this case 1 and 71 respectively. Six analyses were also done using this design and procedure for each testing occasion and each style of materials.

III. RESULTS AND DISCUSSION

The results are presented according to the three types of analysis used in the study: (1) reading rate variability by testing occasion, (2) reading rate variability across testing occasions, and (3) reading time according to purpose, style of materials and testing occasion.

RELATIONSHIPS AMONG VARIABLES BY SEPARATE TESTING OCCASIONS

Relationship of Training to Reading Rate Variability. The data in Tables 6 and 7 show that on the post training test, children trained with passages containing explicitly stated main ideas (stated) did not differ significantly in reading rate variability from children trained with materials with implicit but not specifically stated main ideas (unstated) when either expository or narrative materials were involved. As indicated in Tables 8 through 11, similar results were obtained on the immediate transfer task and the delayed transfer task. In these latter instances the children were given extended passages which were more closely related to actual school reading tasks.

In general, then, the effects of training on reading rate variability were consistent. Whether children were reading expository or narrative materials on the post, immediate transfer, or delayed transfer tests, no differences were found between the group trained with stated main idea materials and the group trained with unstated main idea materials. The implication appears to be that training materials varied on this dimension do not affect childrens' ability to vary their reading rate. Therefore, either type of training materials, with stated or unstated main ideas, should produce similar results if reading rate variability for three reading purposes is the objective of the training.

Relationship of Sex to Reading Rate Variability. Tables 6 through 11 also provide information about the influence of sex on reading rate variability. The results in this instance showed that sex did not make a significant difference in the reading rate variability of children trained with either of the two types of materials. This result was consistent, for boys did not differ from girls in their ability to vary their rate of reading from purpose to purpose on the post-training, immediate transfer and delayed transfer tests when the tests were either expository or narrative in style.

TABLE 6

ANALYSIS OF VARIANCE OF TRAINING, SEX AND GRADE RELATIONSHIPS TO POST TEST READING RATE VARIABILITY FOR THREE READING PURPOSES FOR EXPOSITORY MATERIALS

Source of Variation	df	MS	F
Training	1	.02	<1
Sex	1	.83	<1
Grade	2	2.28	<1
G x S	2	2.05	<1
G x T	2	3.46	1.04
S x T	1	10.07	3.04
G x S x T	2	2.14	<1
Error	60	3.32	

TABLE 7

ANALYSIS OF VARIANCE OF TRAINING, SEX AND GRADE RELATIONSHIPS TO POST TEST READING RATE VARIABILITY FOR THREE READING PURPOSES FOR NARRATIVE MATERIALS

Source of Variation	df	MS	F
Training	1	5.21	1.25
Sex	1	1.00	<1
Grade	2	1.45	<1
G x S	2	3.56	<1
G x T	2	3.68	<1
S x T	1	5.91	1.41
G x S x T	2	.06	<1
Error	60	4.18	

TABLE 8

ANALYSIS OF VARIANCE OF TRAINING, SEX AND GRADE RELATIONSHIPS TO IMMEDIATE TRANSFER READING RATE VARIABILITY FOR THREE READING PURPOSES FOR EXPOSITORY MATERIALS

Source of Variation	df	MS	F
Training	1	1.13	<1
Sex	1	3.53	1.39
Grade	2	.56	<1
G x S	2	2.37	<1
G x T	2	2.21	<1
S x T	1	11.20	4.42*
G x S x T	2	8.71	3.44*
Error	60	2.53	

* $p < .05$

TABLE 9

ANALYSIS OF VARIANCE OF TRAINING, SEX AND GRADE RELATIONSHIPS TO IMMEDIATE TRANSFER READING RATE VARIABILITY FOR THREE READING PURPOSES FOR NARRATIVE MATERIALS

Source of Variation	df	MS	F
Training	1	1.24	<1
Sex	1	3.75	<1
Grade	2	4.68	<1
G x S	2	3.59	<1
G x T	2	11.55	2.07
S x T	1	1.47	<1
G x S x T	2	3.20	<1
Error	60	5.57	

TABLE 10

ANALYSIS OF VARIANCE OF TRAINING, SEX AND GRADE RELATIONSHIPS TO DELAYED TRANSFER READING RATE VARIABILITY FOR THREE READING PURPOSES FOR EXPOSITORY MATERIALS

Source of Variation	df	MS	F
Training	1	.89	<1
Sex	1	7.79	3.49
Grade	2	2.53	1.13
G x S	2	4.50	2.02
G x T	2	1.34	<1
S x T	1	.03	<1
G x S x T	2	3.22	1.44
Error	60	2.23	

TABLE 11

ANALYSIS OF VARIANCE OF TRAINING, SEX AND GRADE RELATIONSHIPS TO DELAYED TRANSFER READING RATE VARIABILITY FOR THREE READING PURPOSES FOR NARRATIVE MATERIALS

Source of Variation	df	MS	F
Training	1	1.37	<1
Sex	1	.88	<1
Grade	2	2.89	<1
G x S	2	2.86	<1
G x T	2	9.59	2.08
S x T	1	13.28	2.81
G x S x T	2	3.67	<1
Error	60	4.72	

Relationship of Grade Level to Reading Rate Variability. As was the case with training and sex, grade level did not influence reading rate variability under the conditions imposed. Tables 6 through 11 clearly reveal no significant differences among fourth, fifth and sixth graders in their reading rate variability for three reading purposes on each of three separate testing occasions. This finding was consistent whether the test material was narrative or expository.

Combined Relationships of Training, Sex and Grade Level to Reading Rate Variability. Although training, sex or grade level did not independently relate to the variability of reading rate for three different reading purposes, there were two cases in which the independent variables in combination did result in significant relationships. First, Tables 8 and 12 indicate that, when reading expository materials on the immediate transfer task, boys and girls showed significantly different reading rate variability depending on the type of training they experienced. As shown in Fig. 1, boys did much better on the immediate transfer test when it consisted of expository materials and when they were trained with stated materials. On the other hand, girls did much better on this task when they were trained with unstated materials.

Second, reading rate variability was found to be significantly different on the immediate transfer task using expository materials when the interactions among the grade, sex and training variables were considered. By referring to Tables 8 and 13 and to Fig. 2, it can be seen that fifth and sixth grade girls did better when trained with unstated materials while the fourth grade girls did slightly better when trained with stated materials.

TABLE 12

MEAN READING RATE VARIABILITY BY SEX AND TYPE OF TRAINING ON THE IMMEDIATE TRANSFER TASK FOR EXPOSITORY MATERIALS

Sex	Type of Training	
	Stated Main Idea Materials	Unstated Main Idea Materials
Males	8.45	7.41
Females	8.11	8.64

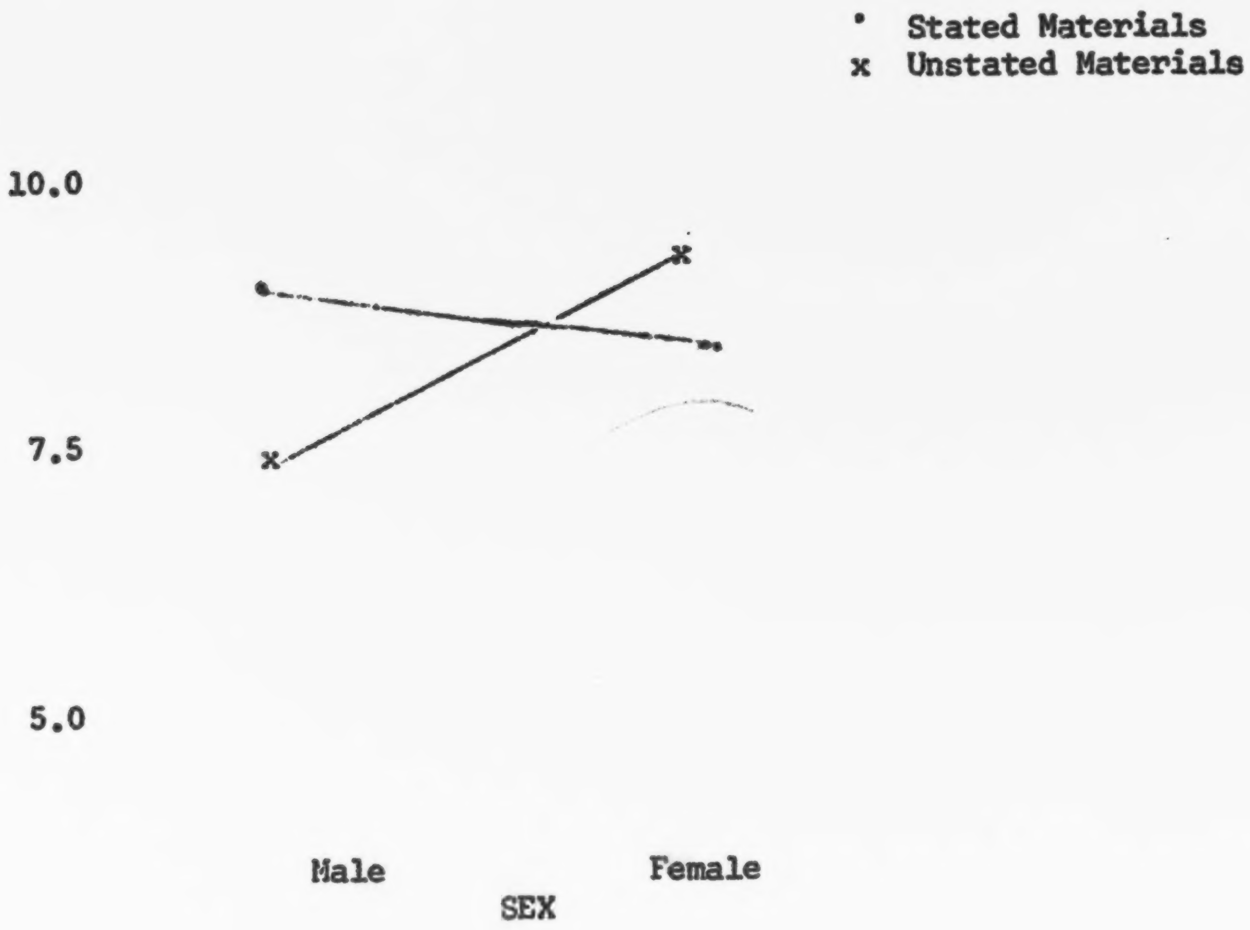

Fig. 1. Mean Reading Rate Variability Interactions by Sex and Type of Training on the Immediate Transfer Task for Expository Materials

TABLE 13

MEAN READING RATE VARIABILITY BY GRADE, SEX AND TYPE OF TRAINING ON THE IMMEDIATE TRANSFER TASK FOR EXPOSITORY MATERIALS

Grade	Type of Training Materials			
	Males		Females	
	Stated	Unstated	Stated	Unstated
4	8.28	7.92	8.30	7.57
5	8.11	8.13	8.08	8.95
6	8.97	6.18	7.93	9.40

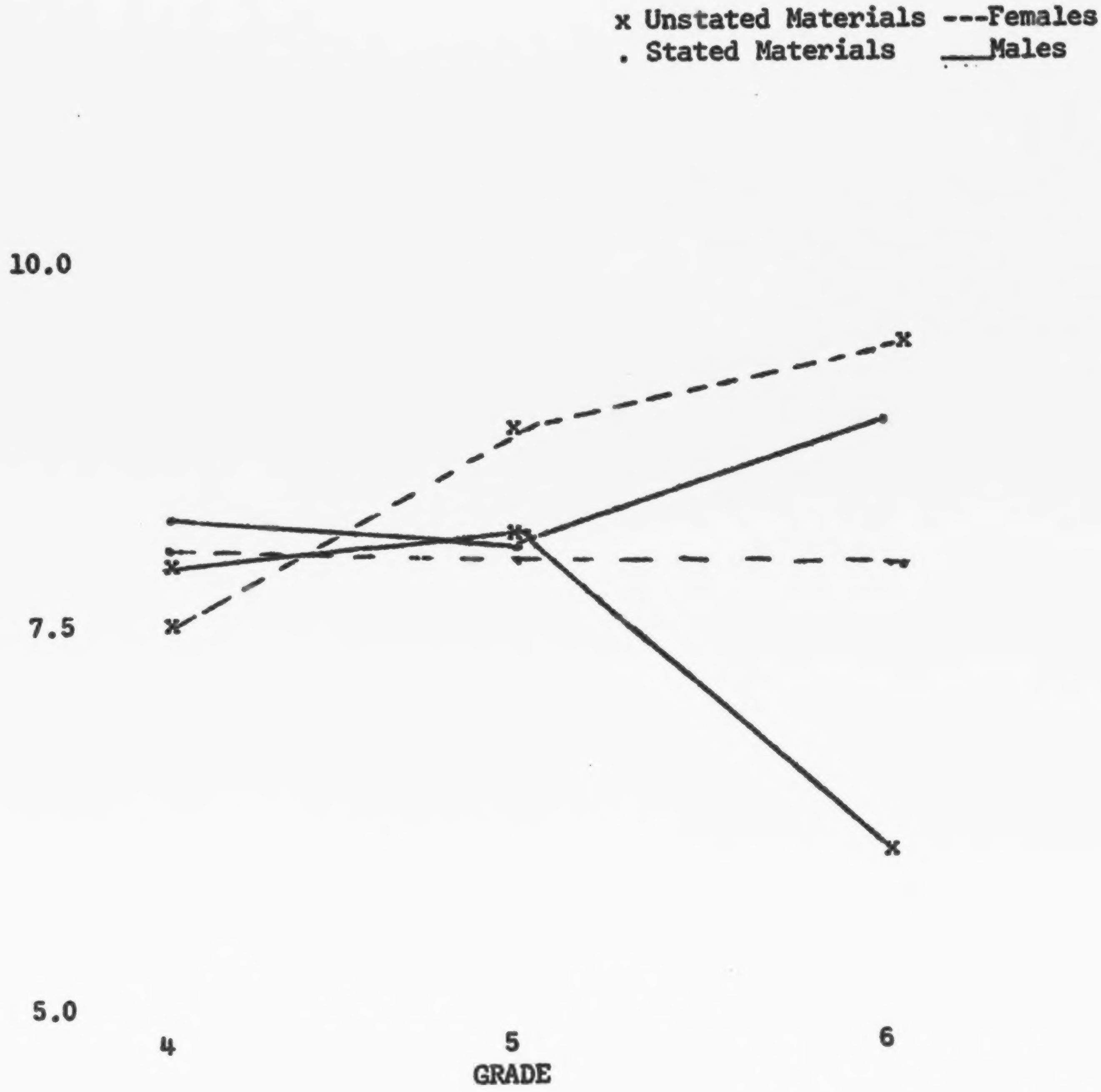

Fig. 2. Mean Reading Rate Variability Interactions by Grade, Sex and Type of Training on the Immediate Transfer Task for Expository Material

Third, it also is apparent that sixth grade boys exhibited substantially more reading rate variability on the immediate transfer task when trained with stated materials while fifth grade boys did approximately the same irrespective of type of training. Finally, it is shown that fourth grade boys did slightly better when trained with stated materials rather than with unstated materials.

RELATIONSHIPS AMONG VARIABLES ACROSS TESTING OCCASIONS

Relationship of Training to Reading Rate Variability. The data in Tables 14 and 15 indicate that the type of training program in which children were placed did not affect their reading rate variability across occasions for either expository or narrative materials.

Relationship of Sex to Reading Rate Variability. Tables 14 and 15 also reveal that sex was not related to reading rate variability across occasions. On neither expository nor narrative materials across testing occasions did boys differ significantly from girls in reading rate variability.

Relationship of Grade Level to Reading Rate Variability. When the relationship between grade level and reading rate variability was studied, results similar to those for training and sex were revealed. As shown in Tables 14 and 15, reading rate variability across testing occasions did not differ significantly by grade on either expository or narrative test materials.

Relationship of Testing Occasion to Reading Rate Variability. Testing occasion was found to have a significant relationship to reading rate variability in one instance. As indicated in Table 14, a difference in reading rate variability across testing occasions--post-training,

TABLE 14

ANALYSIS OF VARIANCE OF TEST OCCASION, GRADE, SEX AND TRAINING RELATIONSHIPS TO READING RATE VARIABILITY FOR THREE READING PURPOSES FOR EXPOSITORY MATERIALS

Source of Variation	df	MS	F
Occasion	2	74.65	27.77*
Grade	2	.00	<1
Sex	1	.00	<1
Training	1	.00	<1
O x G	4	2.69	1.00
O x S	2	6.08	2.25
O x T	2	1.02	<1
G x S	2	.00	<1
G x T	2	.00	<1
S x T	1	.00	<1
O x G x S	4	4.46	1.66
O x G x T	4	3.50	1.30
O x S x T	2	10.65	3.96*
G x S x T	2	.00	<1
O x G x S x T	4	7.03	2.61
Within (error)	180(69)	2.69	

*$p < .05$

TABLE 15

ANALYSIS OF VARIANCE OF TEST OCCASION, GRADE, SEX AND TRAINING RELATIONSHIPS TO READING RATE VARIABILITY FOR THREE READING PURPOSES FOR NARRATIVE MATERIALS

Source of Variation	df	MS	F
Occasion	2	3.57	<1
Grade	2	.00	<1
Sex	1	.00	<1
Training	1	.00	<1
O x G	4	4.01	<1
O x S	2	2.82	<1
O x T	2	3.91	<1
G x S	2	.00	<1
G x T	2	.00	<1
S x T	1	.00	<1
O x G x S	4	5.01	1.03
O x G x T	4	12.41	2.57*
O x S x T	2	10.33	2.14
G x S x T	2	.00	<1
O x G x S x T	4	3.47	<1
Within(error)	180(69)	4.82	

*p <.05

immediate transfer and delayed transfer--took place when the subjects read expository materials. Table 15 shows that this was not the case when the test materials were narrative in nature.

When Scheffé post hoc tests were applied to the data for expository materials, a significant difference was found between the post-training test and the immediate transfer task and between the post-training test and the delayed transfer task. No difference was found between the immediate and delayed transfer tasks. Mean reading rate variability scores by test and type of material can be found in Table 16. The implication here appears to be that not only does the ability to adjust reading rate to purpose transfer from training passages to more naturalistic expository materials, but also that there is an increase in reading rate variability. The increase might be expected on the basis that the expository materials in the transfer test situations were more nearly like classroom materials and less rigidly structured; therefore, the subjects were better able to use their reading rate variability skills. Why this was not the case for narrative materials is not clear.

Combined Relationships of Training, Sex, Grade Level and Testing Occasion to Reading Rate Variability. Two observations may be made when the independent variables of training, sex, grade level and testing occasion were considered in combination. First, as shown in Tables 14 and 15, none of the two-way interactions was significant for either expository or narrative materials.

Second, two of the three-way interactions were significant. Although such interactions must be viewed with some caution due to the repeated measures effect, Table 14 indicates that the structure of the expository

TABLE 16

MEAN READING RATE VARIABILITY BY
OCCASION AND STYLE OF MATERIAL

TYPE	OCCASION		
	Post	Immediate	Delayed
Expository	6.42	8.15	8.21
Narrative	8.01	8.39	8.00

materials apparently was conducive to differential reading rate variability, since the sex by training by testing occasion interaction was significant for such materials. Table 17 and Fig. 3 show that on the post-training task, girls exhibited more reading rate variability when trained with unstated main idea materials. On the transfer task immediately after training, boys who were trained with stated main idea materials varied their reading rate for different purposes more than boys trained with unstated materials, while girls trained with unstated materials did better than girls trained with stated materials. On the delayed-transfer task boys and girls trained with stated materials did better than boys and girls trained with unstated materials.

The second significant three-way interaction appears in Table 15. In this instance, a differential training by grade by testing occasion effect occurred on narrative materials. Table 18 and Fig. 4 provide the basis for a number of observations with regard to this finding:

1. On the post-training test, fourth graders trained with stated main idea materials did better while fifth graders trained

TABLE 17

MEAN READING RATE VARIABILITY BY OCCASION, SEX AND TRAINING FOR EXPOSITORY MATERIALS

SEX	OCCASION					
	Post Test		Immediate Transfer		Delayed Transfer	
	Stated	Unstated	Stated	Unstated	Stated	Unstated
Male	5.92	6.89	8.45	8.11	8.41	7.79
Female	6.70	6.17	7.41	8.64	8.57	7.97

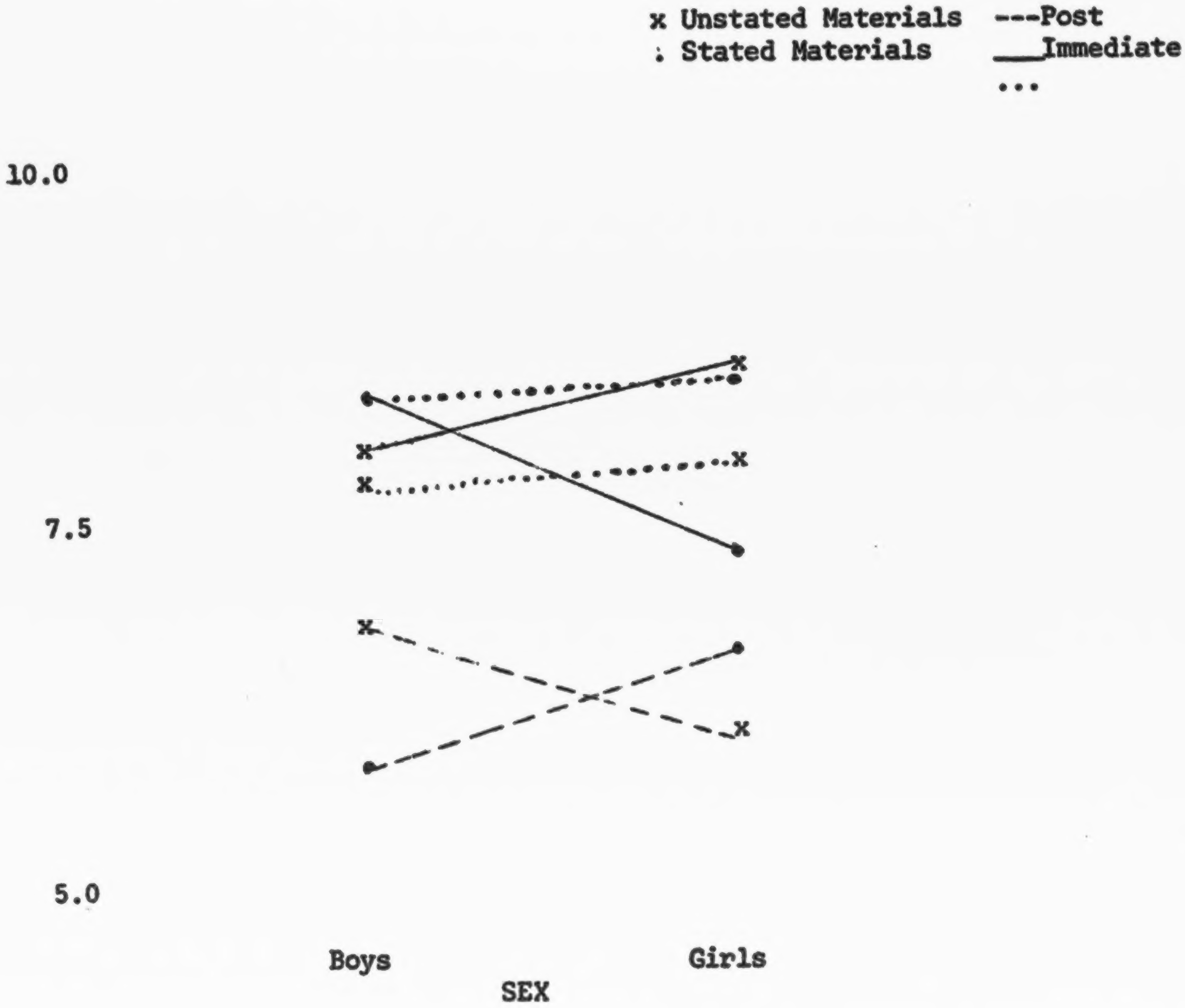

Fig. 3. Interaction of Occasion, Sex and Training on Mean Reading Rate Variability for Expository Materials

TABLE 18

MEAN READING RATE VARIABILITY BY OCCASION, GRADE AND TRAINING FOR NARRATIVE MATERIALS

GRADE	OCCASION					
	Post Test		Immediate Transfer		Delayed Transfer	
	Stated	Unstated	Stated	Unstated	Stated	Unstated
4	8.28	7.17	7.21	8.81	8.91	8.42
5	8.03	7.95	8.61	9.42	7.75	7.03
6	8.60	8.01	8.15	8.14	7.65	8.25

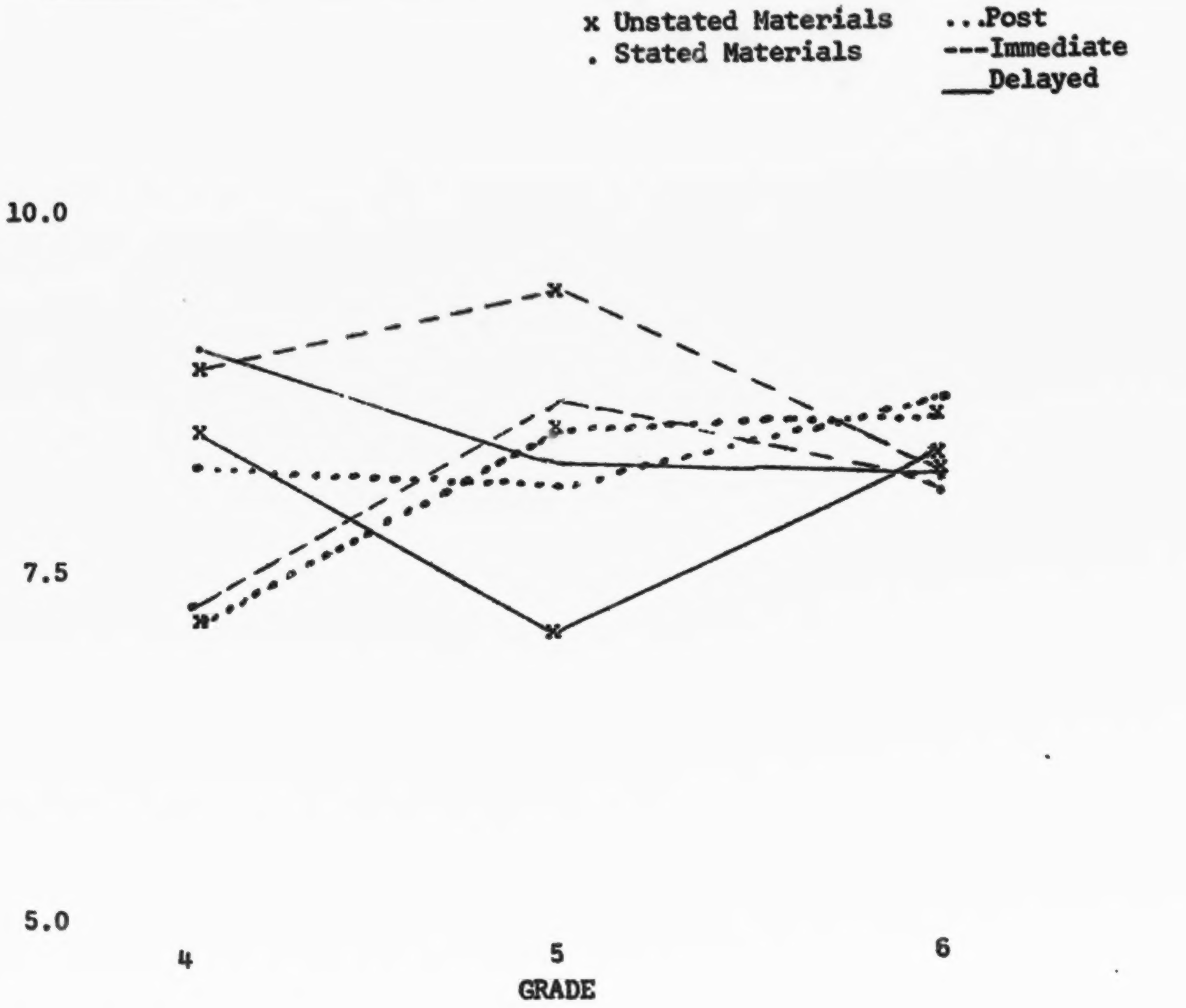

Fig. 4. Interaction of Occasion, Grade and Training on Mean Reading Rate Variability for Narrative Materials

with unstated main idea materials did better, and sixth graders did approximately the same irrespective of type of training.

2. On the immediate transfer task, fourth, fifth and sixth graders did better when trained with unstated materials, while fourth graders differed more with respect to training than did the fifth graders and likewise the sixth graders.

3. On the transfer-retention task, fourth and fifth graders trained with stated materials varied their reading rate for different purposes more than did those trained with unstated materials.

4. The sixth graders did approximately the same on the delayed-transfer task irrespective of their type of training.

MEAN READING TIMES FOR READING PURPOSE AND STYLE OF MATERIALS

Although reading rate variability was the central focus of the present study, it seemed appropriate to consider the relationship between reading time and each purpose on each style of test materials as well. In general, the findings indicated that the mean reading times for full comprehension when reading either narrative or expository material for each of three purposes did differ. The analyses summarized in Table 19 shows that there was a significant difference in the mean reading time for full comprehension by purpose on the post training test, the immediate transfer task and the delayed transfer task. Mean proportions of reading time are shown in Table 20. The trend there is clear and, with but one exception, consistent: the children read most rapidly to find specific facts, less rapidly for main ideas, and most slowly for sequence of ideas. The Scheffé

TABLE 19

ONE WAY ANALYSES OF VARIANCE FOR MEAN READING TIME FOR THREE DIFFERENT PURPOSES WITH EXPOSITORY AND NARRATIVE MATERIALS ON POST TRAINING, IMMEDIATE TRANSFER AND DELAYED TRANSFER TESTS

Description	df	MS	F
Purposes on Expository Post Training Test	2 (1)	.40	40*
Error	213 (71)	.01	
Purposes on Narrative Post Training Test	2 (1)	.72	72*
Error	213 (71)	.01	
Purposes on Immediate Expository Transfer Test	2 (1)	.97	97*
Error	213 (71)	.01	
Purposes on Immediate Narrative Transfer Test	2 (1)	.92	92*
Error	213 (71)	.01	
Purposes on Delayed Expository Transfer Test	2 (1)	.64	64*
Error	213 (71)	.01	
Purposes on Delayed Narrative Transfer Test	2 (1)	.36	36*
Error	213 (71)	.01	

*$p < .05$

TABLE 20

MEAN PROPORTION OF READING TIME FOR FULL COMPREHENSION BY STYLE OF MATERIALS, OCCASION AND PURPOSE

Test and Style	Purpose		
	Main Idea	Sequence	Fact
Post-Expository	.331	.409	.261
Post-Narrative	.389	.393	.218
Immediate Transfer-Expository	.359	.435	.207
Immediate Transfer-Narrative	.348	.438	.214
Delayed Transfer-Expository	.325	.446	.229
Delayed Transfer-Narrative	.383	.366	.252

TABLE 21

MEAN PROPORTION OF READING TIME BY STYLE OF MATERIAL AND PURPOSE

Style of Material	Purpose		
	Main Idea	Sequence	Fact
Expository	.332	.430	.252
Narrative	.373	.399	.288

post hoc test for multiple comparisons reveals significant differences between all means except the Post-Narrative, Main Idea and Specific Fact. This is in line with the logical expectation that with training children would be able to adapt their rate of reading according to reading purpose; that they would be best able to pick out specific facts very quickly; and that the task of reading to arrange ideas in sequence would be most time consuming because the subjects would need to deal simultaneously with several ideas.

Materials were written in narrative and expository styles because there was evidence from the preceding study that style affects reading rate variability. When the means in Table 20 were collapsed across style, however, virtually no difference was found in this study between the narrative and expository means (Expository = .340; Narrative = .333).

Yet, a comparison that takes reading purpose into account, as shown in Table 21, reveals that style interacts with purpose, expository materials being read most rapidly for the main idea but narrative materials being read most rapidly for sequence and for specific fact. By way of post hoc interpretation, it would appear that the expository arrangement of materials makes for more clearly identifiable main ideas. Likewise, the narrative arrangement of materials would tend to have a sequential arrangement built in and, therefore, be more easily identifiable. An explanation of the more rapid reading of narrative materials for specific fact is more elusive, but it might be argued that a narrative sequential arrangement lends clues that make for rapid location of facts.

Summary of the Results

The major findings of the present investigation can be summarized in the following manner:

1. When the relationships of each of the independent variables--training, sex and grade level--to variability of reading rate for three different purposes, for two types of materials, and for three separate testing occasions were studied, several important findings came to light: (a) none of the three independent variables had a significant relationship with reading rate variability under the conditions imposed; (b) all but two of the interactions in this phase of the study were found to be non-significant; and (c) the two significant interactions indicated that the combination of sex and training and the combination of grade, sex and training each had differential effects on reading rate variability on the immediate transfer task when the materials were expository in nature.

2. An analysis of the relationships of training, sex, grade level and testing occasion to reading rate variability for three reading purposes on either narrative or expository materials produced the following results: (a) in only one instance was there a significant main effect; namely, testing occasion was significantly related to reading rate variability on expository materials since there were significant differences between the reading rate variability scores on the post-training test and the immediate transfer task and on the post-training test and the delayed transfer tasks; (b) none of the two-way interactions in this part of the analysis was found to be significant; (c) analyses of the three-way interactions revealed that

test occasion, grade and sex in combination had a significant relationship to reading rate variability for expository materials, and that the combination of test occasion, grade and training was significantly related to reading rate variability on narrative test materials.

3. When mean reading times for the full comprehension of either expository or narrative materials for each of three reading purposes were considered, three results were evident: (a) there was a significant difference in the mean reading time by purpose on the post-training test, the immediate transfer task, and the delayed transfer task; (b) children generally read most rapidly to find specific facts, less rapidly for main ideas, and most slowly for sequence of ideas; and (c) although there was no difference between narrative and expository mean reading times when means were collapsed across style, further study indicated that expository materials were read most rapidly for main ideas while narrative materials were read most rapidly for sequence of ideas and for specific facts.

IV. CONCLUSIONS AND IMPLICATIONS

The central purpose of the investigation was to determine whether reading rate variability developed with short, rather tightly constructured training materials would transfer to longer, more school-like passages immediately after training and one month after the training had ended. The results related to this objective provide a basis for a number of observations.

1. It appears that neither the type of training program, the sex of subjects, nor the grade level of subjects has a significant

relationship to reading rate variability as it was defined and measured in the present study. In other words the three independent variables did not individually influence reading rate variability. This was demonstrated when Training Group I and Training Group II were compared, when boys and girls were compared, and when fourth, fifth and sixth graders were compared either on each of the three testing occasions or across testing occasions. Apparently, none of the independent variables was powerful enough to individually influence the development or transfer of reading rate variability to an appreciable extent.

This is not to say that the primary goal of the study was not achieved, for on the basis of the data, particularly the finding that testing occasion had a significant relationship to reading rate variability on expository test materials, it seems clear that whatever reading rate variability existed at the end of the training period was transferred to longer, more school-like materials. Moreover, it appears that fourth grade is not too early to begin helping children develop a flexible rate of reading and that, in general, either one of the training treatments would be of value here.

2. Although the variables of training, sex and grade level were not independently related to reading rate variability, there were several results which indicated that these variables in combination had a differential effect on reading rate variability particularly on the immediate transfer task when it was expository in nature. It appears that boys benefit more from training materials that have stated main ideas while girls benefit more from training materials

with unstated main ideas. This finding might suggest that boys and girls should receive differential treatment during a training program if one wants to maximize the transfer of reading rate variability. On the other hand, the finding that the combination of training, sex and grade also has a significant relationship with reading rate variability on the immediate transfer test for expository materials tends to confuse the issue. In this latter instance, fourth grade boys and girls and sixth grade boys did better on the immediate transfer task on expository materials when they were trained with stated materials, while fifth and sixth grade girls did better on this task when they were trained with unstated materials.

It would seem, then, that the selection of training practices might well be based on a practical rather than a purely statistical rationale. If one accepts this thinking, the decision concerning the type of reading rate variability training must rest on the cruciality of training at either fourth, fifth or sixth grade and for either boys and girls. The most reasonable conclusion seems to be that transfer of reading rate variability would be maximized if the subjects were fourth grade boys placed in a training program which utilizes stated main idea materials.

3. Since four of the five significant results with respect to reading rate variability were found when the tests involved were expository in style, it may suggest that expository materials may provide a more utilitarian medium for developing and demonstrating transfer of flexibility in rate of reading than will narrative material. This, of course, would be when the subjects are fourth,

fifth and sixth graders and when the purposes for reading are for specific fact, for sequence of ideas and for main ideas.

4. A final implication of this study is that the results and their interpretation must be considered in the light of the operational definition of variability of reading rate employed and the type of variability score used. The basic problem encountered in this and the preceding study was to find a method of defining and scoring which would preserve the proportional relationships among individual reading speeds for three reading purposes under conditions of training which produced marked increments in reading speed.

In the previous Project 1755, indices or ratios of the actual reading time for one reading purpose in relation to another were used, with variability in reading rate being defined essentially as the differences among such ratios. While this approach to the problem had the advantage of directly preserving raw score ratios of one reading time to another regardless of actual reading speeds, it suffered from the disadvantage of the lack of a common base for determining variability because of the use of the ratio scores in the analysis.

In the present project, therefore, a simpler and more rigorous type of analysis was attempted using the standard variance formula which means in this case that variability in reading rate is the difference in an individual's reading rate for one purpose in relation to his mean reading rate for all reading purposes. In order to carry out this type of analysis, reading speed scores were adjusted proportionally to the slowest reading speed.

In retrospect, the precise effects of converting original speed scores to a common denominator of the slowest reading speed for the purpose of analysis are not entirely clear with respect to the concept of variability in reading rate. Does such a conversion, for example, exercise a disproportional rather than truly proportional effect in representing original speed relationships? Does the concept of variability in reading rate imply the same degree of variability for a set of relatively slow reading speeds versus a set of relatively high reading speeds? Questions such as these and others may be raised which suggest to the experimenters that a completely tenable way of attacking the problem of variability in reading rate remains yet to be found. The results of this study should be viewed accordingly.

APPENDIX A

Examiner's Directions

DAY ONE

Pre-Training Program

__Situation__. There will be one instructor (Basic Skills Laboratory Staff member) and five examiners per training session. Each examiner will work with four children. Arrange tests and data sheets so they are opposite the correct child.

__Equipment__. 4 Stop watches for each examiner. [Check method of operation. Wind watches each day.]

Sample selection booklets for examiners and subjects

Training selection booklets and data sheets

Extra answer sheets

Test keys for every examiner

Paper clips

Pencils (regular and colored)

Sample selection folders (for Research Staff only)

Books (for those children who do not bring their own)

__Procedure__. [Introduce selves to pupils.] I am ___________ ___________. [Write name on board.] This is ___________, ___________, etc. [Introduce others.] You have been asked to come here to help us find out more about how we read. What you do will __not__ be reported to your teachers or used for your report card, but we hope you will all do your best to help us. We will be meeting with you each day for the next two and one-half weeks, so we will need to know your names. Will you tell us your name? [Indicate one child, the next, etc.]

[Clarification of Main Idea, Order and Specific Fact]

First we are going to read some paragraphs together. Sometimes we read to find __main ideas__. Sometimes we read to remember the __order in which things happen__. Other times we read to find one short answer or __specific fact__. Now let's be sure that you understand what we mean by reading for the __main idea__, reading to remember the __order in which things happen__, and reading to find a __specific fact__.

FOR UNSTATED GROUP ONLY

[Main Idea.] The kind of main ideas we will work with will be a statement or sentence that has two parts. One part of the sentence will tell us the very general topic, such as a title. Another part of the sentence will tell us something more particular about the general topic.

We will see how these two parts of the main idea are necessary. [Show folder 1a, Mr. Potts.] Read this story and think about the main idea. [After it has been read, show multiple choice selections.] Here are some possible main ideas for the story you have just read. [Read each one outloud. Point to the correct main idea and explain that it fits the criteria by presenting the general topic (Mr. Potts) and a specifier (getting ready for a trip). Explain that the other choices are incomplete because they do not tell enough about the whole paragraph.]

This time you will read the story and choose the main idea yourself. [Show folder 1b, Mr. Potts. After it has been read, show the main idea choice selections.] Which sentence tells us the general topic of the paragraph and something more particular about the general topic? [Pause.] Yes. [If wrong, ask question, "What is the whole story about?"] That is really the main idea of the story. All the other sentences just tell what he did to get ready to wash the car.

[Show both Potts folders together.] What does the main idea of this story [Point to folder 1a.] have in common with the main idea of this story? [Point to folder 1b. Pause.] Yes, the two main ideas tell us that each story is about Mr. Potts. Because the stories are not exactly the same, however, we have to have the second part of the main idea statement in order to tell us that Mr. Potts is doing something different in each story.

[Here the examiner could remove the two correct main idea statements. He could then cover the second part of each one so that only "Mr. Potts" was visible after the children responded to the first question. Then he could remove the cover from the rest of the statement so that the children could see the difference in the second half of the main idea statements.]

FOR STATED GROUP ONLY

[Main Idea.] The main idea is the sentence that tells the most about what is in the selection. The kind of main ideas we will look for in a paragraph will be a sentence that has two parts. One part of the sentence will tell us the very general topic, such as a title. Another part of the sentence will tell us something more particular about the general topic. Read to find the main idea in this story. [Show folder 1, Mr. Potts 1a.] If you could pick just one sentence to tell what this whole story is about, which sentence would it be? [Pause.] Yes. [If wrong, ask question--"What is the whole story about?"] That is really the big idea in the story. All the other sentences just tell what he did to get ready for this trip.

[Show Mr. Potts 1a, folder 2.] What is the main idea now? [Pause.]

[Show Mr. Potts 1a, folder 3.] If it were this way in the story, what would be the main idea? [Pause.]

If the sentences were all mixed up, could you still find the main idea? [Show Mr. Potts 1a, folder 4. Pause.] Fine.

[Sequence or Order.] Now let's look at what reading to find the right order means. Reading to find the order in which things happened means paying attention to what happens first in the selection, what happens next, what after that, and so on. You need to remember where different ideas come in the story, so you can tell the right order. Let's look at another story. [Show The Divers, folder 1.] Read it to remember the order in which things happen. [Pause.] If these sentences were all mixed up, could you put them in the right order? [Show The Diver, folder 2.] What did he do first? [Pause.] What did he do second? [Pause.] What did he do third? [Pause.] What did he do fourth? [Pause.] Now we've put the story back in the right order. [Show The Diver, folders 1 and 2.]

[Specific Fact.] Now let's see what reading for a specific fact means. It means that you are going to be looking for one short answer, like looking up someone's number in a telephone directory. What should you do? You would need to do two things: (1) you would look for just the name you want, and then (2) you would look across to his number. You would stop reading as soon as you have found your answer. Here is a list of telephone numbers. Raise your hand as soon as you find the answer to this question: What is the telephone number of John Bates? [Show Telephone Directory folder.] Good. Now let's try to find a specific fact in a story. Raise your hand as soon as you find the answer to this question: "What did Father ask to see?" [Show The New Car folder.] Good. Did you stop reading when you found the right answer? Good. [Discuss if necessary.]

Do you understand the three different purposes for which we will ask you to read? [Answer questions.]

[Helper examiners start here, seeing that subjects follow selection and point to correct answers. Distribute sets of sample selections of Mr. Potts la, The Diver, and The New Car.]

Now let's look at some sample selections. Here is a selection which you are to read to find the main idea. Watch on your paper where I'm reading. [Read aloud through the Mr. Potts directions page.] Wait until we tell you to turn the page. Turn the page. This is the Mr. Potts selection you just read. At the bottom it says, "Raise your hand. Do not re-read." Turn the page. [Read aloud the directions on the answer sheet.] Point to the one you would mark with an X. Good. Turn to the next page. Notice there are two answer sheets. If you do not choose the correct main idea the first time, you will have a chance to read the story again and get the answer right.

Next is the selection, The Diver. You are to read to remember the order in which things happen. The direction page is the same except for this part. [Read aloud the whole purpose sentence.] Wait until we tell you to turn the page. Turn the page. This is The Diver story you just read. At the bottom it says, "Raise your hand. Do not re-read." Turn the page. [Read aloud directions on answer sheet.] Point to the answers. Which sentence will you mark 1? 2? 3? 4? Good. Turn to the next blue page. You'll have more than one chance to get the answers right if you need it.

Next is a selection, The New Car. It says to read to find the answer to the question, "What did Father ask to see?" Wait until we tell you to turn the page. Turn it now. This is The New Car selection you just read. At the bottom it says "Raise your hand. Do not re-read." Turn the page. [Read directions aloud on the answer sheet.] Point to the one you will mark with an X. Good.

Training Program

For the next two weeks you will be reading many selections. We would like to have a record of your reading time. So today you are going to learn how to tell time on a new kind of watch called a stop watch. These watches are used to record the time for races, contests and games. [Pass out stop watches and pads.] These watches, which are being placed on small rubber pads on your desks, are easily broken. They should always be left on the rubber pads. Never pick them up. You start the watch by pressing the top. [Demonstrate, holding watch flat in one palm.] You don't have to pick up the watch to do this. Let's start it--Press. Notice how fast the long hand moves. What is it counting? Yes, seconds. Press the top of the watch again. What happened? Press the top again. What happened? Yes, now we are ready to start over.

Let's count the seconds together when we start our watches this time. Ready--start! 1,2,3,4,etc. Stop! [on 15"] How many seconds did we count? Yes, 15. The seconds are shown on the big dial by the big hand. What do you think is shown by the little hand? [Minutes.] Yes, minutes are shown on the little dial by the little hand.

[These are special instructions for 60" stop watches.] Look at the short hand. Has it reached the first mark? If not, this means that less than 60" have passed.

Now let's start over again. Press your watches. Are all watch hands pointing up? Let's count together again. Ready--start. 1,2,3,4, etc. Stop. [on 45"]

Look at the short hand. Has it reached 1 minute? No, it has not. How do you know? Yes, each mark stands for a minute. Only every third mark is numbered. Look at the long hand. How many seconds passed? Yes, 45.

Let's start over. Press. Are all the watch hands in place? Ready? Start! Now look up. Stop. [at 1' 10"] Where is the short hand now--is it

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past the first mark? Then how much time has passed? Yes, one minute, 10 seconds. How many seconds passed? Yes, 70 seconds. You will record your reading time in seconds.

Here is a time record sheet on which you will write down your reading times. [Hand out Time Record.] Let's practice using it now.

Press the top of your watch. Are all the watch hands pointing up? Ready? Start. Now look up. Stop. [at 18"] How much time has passed? Now record that time in the first column on the line beside first reading. [Examiner checks each pupil's recording.]

Let's do it again. Press the top of your watch. Are the watch hands pointing up? Ready? Start. Now look up. Stop. [at 42"] How much time has passed? Record that time in the first column on the line beside second reading. If you had read the story twice, this is where your second reading time would be written. [Examiner checks each pupil's recording.]

Follow same procedure for:
third timing (27")
fourth timing (1' 6" = 66")
fifth timing (7")

Now, let's add together these five reading times. Your answer goes on the line beside the words "total seconds." If you had read the selection five times, this answer would give you the total reading time in seconds for that selection.

You are going to use watches and time record sheets like this to keep a record of the time it takes you to read a selection. [Give each child a set of the first three selections: 52/M, 11/S, 92/F. Examiners are to print the child's name on the time record sheet today. Also, after the child has completed each answer sheet, print his name on each answer sheet used.]

Here are three selections. Let's read the directions for the first one together. [Read aloud.] "Look at your watch. Do the hands point up?" Be sure to check this each time before you start reading a new selection. It is very important that your watch is ready for use before you begin to read. [Continue reading the directions.] "You are to read this selection once for this purpose: To find the most important or main idea." What do you look for when you read to find the main idea? [Children answer.]

FOR UNSTATED GROUP ONLY

You decide what the general topic of the whole paragraph is and what particular thing the paragraph tells about that general topic.

FOR STATED GROUP ONLY

You look for the one sentence that tells you most about the whole selection. The main idea can be found any place in the selection.

[Continue reading the directions.] "If you don't know a word, raise your hand and we will help you. Remember, you are to read the selection once, to find the most important or main idea." Before you turn the page, let me explain. It will say at the top of the next page: "Start your watch." As soon as you have finished reading the selection once, stop your watch. Do you understand? Good. Now, turn the page and follow the directions. [When all children have finished and stopped watches, Examiner reads aloud the directions at the top of the third page.] Then, do what the directions have asked you to do. [Wait until this has been done. Examiners check.]

[Continue reading the directions.] "Record your time" on the time record sheet. We have used the first column for practice. Put your reading time on the first blank in the second column. Notice that the number of the story you just read is written at the top of the column. Today we will wait until everyone is finished before going on to the next selection, but from then on everyone can work at his own rate.

Some of you were able to find the main idea after one reading. [Examiners give these children books to read.] Because we want everyone to find the main idea, the rest of you will have a chance to read again. [Examiners should number a second answer sheet, print the child's name on it, place it on top of the first answer sheet and then place the selection and direction sheet on top of the new answer sheet.] Re-read the purpose which is at the bottom of the direction sheet. Now, you are going to do exactly what you did when you read this selection the first time. [When the child identifies the correct response, mark that response with a C.] [Pupils should work independently, time themselves, read the selection, do the answer sheet and record their time. Examiners should check the answers, the time recorded and clear the watch. If the child does not reach 100% performance in 5 trials, mark an F by total score.]

Now read the directions for the next selection. When you have read the directions carefully, you may go ahead and do the work. [Examiners should be sure the watches are cleared and ready for use before the pupils read. NOTE: This is a sequence task. If pupil does not get all the answers correct in one trial, mark the correct responses with a C and transfer the correct responses only to the next answer sheet. Be sure all answer sheets are numbered and have the pupil's name.]

[Pupils may go ahead and repeat the procedure for the third selection.]

Today, you learned to use stop watches and time record sheets to keep a record of your reading time when you read for three different purposes. What were the three purposes? What does it mean to read for these three purposes? [Discuss and have pupils redefine purposes.]

Tomorrow, you will be given a graph on which you can record your reading time each day. This graph will help you know how fast you read for each of the purposes we talked about today. Before tomorrow, think about this question: Does your purpose for reading make a difference in your rate or speed of reading? Tomorrow we will talk about this question.

You are to bring a library book to read each day. Please sit at the same table when you come tomorrow.

DAY TWO

[Examiner: Check to make sure that the selection numbers which appear on the daily time record sheet correspond to the selections in each child's packet.]

Think about the three purposes for which you read yesterday. What were those three purposes? [Children answer.]

Yesterday we asked you to think about the question: Does your purpose for reading make a difference in your rate or speed of reading? What did you decide? [Pause for answers.] Why?

Knowing your purpose can help you plan what you are going to do. How should you read when you are asked to find just one specific fact, e.g., "What did Father ask to see?" [Pause.] Yes, very quickly. What can you do when you have found the fact? Yes, you can stop reading because you have accomplished your purpose.

FOR UNSTATED GROUP ONLY

What do you do when you read to find the main idea? [Pause.] Yes, you decide what the general topic of the whole paragraph is and what particular thing the paragraph tells about that general topic. Reading for the main idea in this way will help you think of it more quickly and accurately.

FOR STATED GROUP ONLY

What do you do when you read to find the main idea? [Pause.] Yes, you look for the sentence which tells the most of what the whole story is about. If you are ready to find the main idea, you will find that you can read the other parts of the selection more rapidly.

What do you do when you read to remember the order in which things happen? [Pause.] You remember what happens first in the selection, what happens next, what happens after that, and so on.

Should you read at the same speed for all three purposes? For which purpose do you think you would read fastest? [Pause.] Slowest? [Pause.] Do you know why we asked you to keep a record of your reading time? [Pause.] Yes, but we are not interested in just how fast you read; we want you to learn to adjust your reading speed to different purposes. We believe you will be better readers if you learn to do this.

Today you are going to read three more selections (51/M, 13/S, 91/F). We want you to think about your purpose for reading each selection. Then try to find your best reading speed for that purpose.

Turn to the first selection. Read the directions carefully. Then start your watches, read for the right purpose, and stop your watches. Do the answer sheet, record your time, and raise your hands to have your answers corrected and your watches checked. Do not clear your watches after you stop reading. When you finish reading and re-reading until you have the right answer, wait until everyone has finished. Ready? Begin reading the directions. [Examiners: check carefully to be sure pupils follow directions. Check starting of watches, stopping of watches, recording of time, etc. Provide pupils who finish early with books if they have not brought a book with them. After a child finishes reading a selection, transfer the number of words (in red pencil) for the selection from the answer key to the time record sheet--immediately below the space for total seconds.]

You will need to keep a record so that you can see how much you are adjusting your reading speed to different purposes. Here is a table to show you how many words you read per minute. [Hand out Conversion Table.] It is called a Conversion Table.

Look at the headings of the columns. The first heading says "Time in Seconds." This means the number of seconds it takes you to read a selection. Look at your time record sheet. How many seconds did it take you to find the main idea? Slide your finger down the first column in the Conversion Table until you reach that number.

Now, look at the numbers at the top of the other columns. Those numbers tell you how many words there are in a selection. On your daily time record sheet, look at the red number underneath the number for "Total Seconds." This is the number of words in the story you just read. Slide your finger across the Conversion Table until it is in the column headed by that number, 62. Your finger will then be under the number of words you would have read if you had read at the same rate for exactly one minute. Write this number on your time record sheet in the last space in the first column.

[Examiner: watch carefully that each child finds correct number.]

Let's practice finding a few more words per minute scores. Find 20 seconds in the first column. If you had read this 62 word selection in 20 seconds, how many words would you have read in a minute? Yes, 186.

Find 39 seconds in the first column. [Pause.] You're right, 39 isn't on the table. We will use the nearest number. But here they are both the same distance away, so we will use the next smallest number, 38. Suppose your selection had 66 words. How many words per minute would you have read? Yes, 104 words per minute.

Now find 72 seconds. Because 72 isn't on the table, use the nearest number, 70. How many words per minute would you have read if your story had 85 words? Yes, 73 words per minute.

Now find how many words per minute it would be if you read 103 words in 108 seconds. What number do you use? [Pause.] Yes, 110, because that

CONVERSION TABLE

No. of Words:	58	62	66	74	76	85	90	100	103
Time in Sec.									
2	1740	1860	1980	2220	2280	2550	2700	3000	3090
3	1160	1240	1320	1480	1520	1700	1800	2000	2060
4	870	930	990	1110	1140	1275	1350	1500	1545
5	696	744	792	888	912	1020	1080	1200	1236
6	580	620	660	740	760	850	900	1000	1030
7	497	531	566	634	651	729	771	857	883
8	435	465	495	555	570	638	675	750	772
9	387	413	440	493	507	567	600	667	687
10	348	372	396	444	456	510	540	600	618
11	316	338	360	404	414	464	491	545	562
12	290	310	330	370	380	425	450	500	515
13	268	286	305	342	351	392	415	462	475
14	249	266	283	317	326	364	386	429	441
15	232	248	264	296	304	340	360	400	412
16	211	232	248	278	285	319	338	375	386
17	205	219	233	261	268	300	318	353	364
18	193	207	220	247	253	283	300	333	343
19	183	196	208	234	240	268	284	316	325
20	174	186	198	222	228	255	270	300	309
21	166	177	188	211	217	243	257	286	294
22	158	169	180	202	207	232	245	273	281
23	151	162	172	193	198	222	235	261	269
24	145	155	165	185	190	213	225	250	258
25	139	149	158	178	182	204	216	240	247
26	134	143	152	171	175	196	208	231	238
27	128	138	147	164	169	189	200	222	229
28	124	133	141	159	163	182	193	214	221
29	120	128	137	153	157	176	186	207	213
30	116	124	132	148	152	170	180	200	206
31	112	120	128	143	147	165	174	194	199
32	109	116	124	139	142	159	169	188	193
33	105	113	120	135	138	154	164	182	187
34	102	109	116	131	134	150	159	176	182
35	99	106	113	127	130	146	154	171	177

CONVERSION TABLE (Cont'd.)

No. of Words: Time in Sec.	58	62	66	74	76	85	90	100	103
36	97	103	110	123	127	142	150	167	172
38	92	98	104	117	120	134	142	158	163
40	87	93	99	111	114	128	135	150	154
42	83	89	94	106	108	121	129	143	147
44	79	85	90	101	104	116	123	136	140
46	76	81	86	96	99	111	117	130	134
48	73	78	82	92	95	106	113	125	129
50	70	74	79	89	91	102	108	120	124
52	67	72	76	85	88	98	104	115	119
54	64	69	73	82	84	94	100	111	114
56	62	66	71	79	81	91	96	107	110
58	60	64	68	76	79	88	93	103	106
60	58	62	66	74	76	85	90	100	103
65	54	57	61	68	70	78	83	92	95
70	50	53	57	63	65	73	77	87	88
75	46	50	53	59	61	68	72	80	82
80	44	46	50	56	57	64	66	76	77
85	41	44	47	52	54	60	64	71	73
90	39	41	44	49	51	57	60	67	68
95	37	39	42	47	48	54	57	63	65
100	35	37	40	44	45	51	54	60	62
105	33	35	38	42	43	49	51	57	59
110	32	34	36	40	41	46	49	54	56
115	30	32	34	39	40	44	47	52	54
120	29	31	33	37	38	43	45	50	52
125	28	30	32	35	36	41	43	48	49
130	27	29	30	34	35	39	42	46	48
135	26	28	29	33	34	38	40	44	46
140	24	27	28	32	32	36	39	43	44
145	24	26	27	31	31	35	37	42	43
150	23	25	26	30	30	34	36	40	41
155	22	24	26	29	29	33	35	39	40
160	22	23	25	28	28	32	34	38	39

is nearest to 108. The number of words per minute is 56.

Now read the second selection. Follow directions carefully. When you have finished and your work has been checked, use the Conversion Table to find the number of words per minute you read. Record this number on your daily time record sheet. Then go on to the third selection. [Examiner: check work and conversion.]

[When all have finished reading, hand out graphs and colored pencils.]

Now you will record your word-per-minute scores on these graphs. The numbers on the left side of the graph indicate words per minute. The numbers across the bottom of the graph will be the numbers of each of the selections you will read.

We will always use a red pencil to record scores of all selections read for the main idea. Look at your daily time record sheet. In how many words per minute did you read the first selection? Put a red dot on the graph to show this number. Mark it lightly at first. When it has been checked, mark it clearly.

We will always use a blue pencil to record scores of selections read to remember the order in which things happened. In how many words per minute did you read the second selection? Put a blue dot on the graph to show this number. Mark it lightly. Have it checked, then mark it clearly.

We will always use a green pencil to mark scores for specific fact. In how many words per minute did you read the third selection? Put a green dot on the graph to show this number.

Look at your graphs. On how many graphs is the red dot highest? The blue dot? The green dot? If the green dot is highest, this means that you read fastest to find one specific fact. Tomorrow you will use these graphs again to do two things: first, to plan how fast you will read the next selection for each purpose; and second, to record the words per minute for each selection. Your graphs will tell you how much you are adjusting your reading speed to your purpose.

DAY THREE

Yesterday you recorded your reading time on a graph. Let's take a look at the graphs. What does the blue dot mean? the red dot? the green dot?

Now you are going to read three more selections (53/M, 12/S, 93/F). You will read the first selection to find the main idea. But today you have something new to do. Read your direction sheet. [Pause.] What is the new direction? [Call on someone to read it.] "Put a red X on the graph to show how fast you plan to read this selection."

We want you to decide how fast you plan to read a new selection. To do this, you should do two things: first, look at the purpose for which you will read; and second, look on your graph to see how fast you read the last selection for the same purpose. Remember: Think about how fast you read last time for this purpose and what the purpose is. Now decide how fast you plan to read this selection and put a red X on the graph to show how fast you plan to read this selection.

Some of you may plan to read faster; some may plan to read slower. Each one of you must plan for himself. [Pause.] We want you to learn to plan how fast you will read each new selection. This will help you understand better how fast you actually do read. It will also help you discover that you can read at different rates for different purposes. [Check that all make prediction.]

Have you checked your watch? Remember to start it when you begin to read and to stop it when you finish. Then you can go on to your answer sheet. When you finish that, record your time, and have your answer sheet checked. Re-read if necessary. Then use your Conversion Tables to get the right answer, because you have not finished your reading task until you have accomplished your purpose for reading. When you finish, wait for the others. Now finish reading your direction sheet and begin work. Ready? Start.

[Pupils do first selection. Check comprehension, time recordings, and clear watch. If 100% performance has not been achieved, give student new answer sheet and have him read directions, re-read selection, do comprehension check, and record time for reading selection again. Offer any help necessary for conversion of reading time to rate via Conversion Table.

Complete the time record sheet.]

[When all have finished.] Now take the words-per-minute score and put a red dot on the second line of your graph to show this score (your reading rate). Draw a line to connect it with yesterday's red dot. If the dot is higher today than yesterday, you read faster today. How many read faster? How many read slower? Look at the rex X. How many planned to read faster? Slower? About the same? If the red dot for today is near the red X, you are learning to read as you planned.

Now we are going to read another selection to remember the order in which things happen. When you get to the new direction, stop. [Pause until pupils read to that place.] Look at your purpose. Now look at the blue dot which shows yesterday's score for this purpose on your graph. Plan how you will read for this purpose today. Now, do what the new direction says: Put a blue X on the graph to show how fast you plan to read this selection. Then continue reading your directions and go on with your work as before. [Examiners be sure to mark the correct responses with a C and transfer them to the next, numbered answer sheet.]

[When all have finished.] Now take the words-per-minute score and put a blue dot on the second line of your graph to show this score. Draw a line to connect it with yesterday's blue dot. How many read faster? Slower? As you planned? If the blue dot is near the blue X, you are learning to read as you planned.

Now we are going to read another selection to find a specific fact. The "specific fact" is the thing that is the answer to the question. When you get to the new direction, stop. [Pause.] Look at your purpose. Look at the green dot for yesterday's score for this purpose on your graph. Now decide how fast you plan to read this selection. Put a green X on the graph to show how fast you plan to read this selection. Then continue reading directions and go on with your work.

[When all have finished.] Do you have any questions about the directions? [Pause.] the Conversion Table? [Pause.] the graph? [Pause.] Anything else? [Pause.] Good!

Now you have learned how to read directions, to plan how fast you will read, to time yourselves, and to record how fast you did read. Tomorrow and the next few days we will ask you to read more selections exactly as we have shown you today. Remember, we want you to try to make your reading speed fit your purpose. This will help you become a better reader.

DAY FOUR

Today you are going to read six selections (60/M, 62/M, 72/M, 81X/F, 2X/S, 48X/M). Before you read each selection, you will follow directions and mark your graphs to show your plan for reading. Then you will finish reading directions. Remember to start your watches and stop your watches at the right times. Be sure to have your teacher check after you record your time before your watch is cleared. Do any of you have any questions? Then you are ready to start.

[All examiners will put the six selections in a pile before each pupil and say,] These are the selections you will read today. Because each of you will be reading on your own, you will not necessarily be working on the same paragraph, or with the same color pencil as your neighbor. If you have no questions, you may start as soon as you are ready. [Check all steps very carefully.]

POST AND TRANSFER TESTING

Situation. There will be one examiner per two children. If possible, children should be seated opposite the examiner at a table. Only the materials needed for testing the particular children should be on the table. Arrange tests and data sheets so they are opposite the correct child. Examiners will do the stop watch timing for each child.

Equipment. 2 Stop watches for each examiner. Check method of operation. Wind watches each day.

- Test booklets and data sheets
- Extra answer sheets
- Test keys
- Paper clips
- Pencils

Procedure. [If you do not already know the children, introduce yourself to them.]

POST TESTING

The paragraphs you will read today are like the ones you have been reading, except that they may or may not contain statements of the main idea.

Read the directions on the yellow sheet carefully to yourself. Be sure you understand the purpose for reading. When you finish reading the directions, look up. We will tell you when to turn the page and start reading. [Wait for pupils to read.] Remember to raise your hand when you're through reading. Turn the page. Begin.

[Examiner starts timing. Stop watch when child raises hand. If child stops with a question, stop watch, record time, and re-start watch when he starts reading again. Record both times in one space on the time record sheet. Examiner times reading time to nearest second, recording time in seconds in proper column on the right child's time record sheet. If re-reading is necessary, record time for second reading in space provided. Times will be totaled later. Check answer sheets immediately on completion. Put no marks on original sheet unless all are correct. Then mark with a large C.]

[Note: Follow directions below according to purpose for which child is reading.]

Sequence Only. [If child does not get all answers correct, transfer correct numbers to new answer sheet, marking correct answers with a C. Number new answer sheet, e.g., 2, and make sure child's name is on all used answer sheets.] These are the ones that were right (or They weren't right). [Show second answer sheet.] We want you to get them all right. [Turn back to the direction page.] Read the purpose again, (pointing to the bottom of page) and let me know when you're done. [After child reads purpose,] Remember to raise your hand when you're through reading. Turn to the next page. Begin.

Alternative for Main Idea and Specific Fact. [Place new answer sheet on top of old one.] That wasn't right. We want you to get them all right. [Turn back to the direction page.] Read the purpose again, (pointing to the bottom of page) and let me know when you're done. [After child reads purpose,] Remember to raise your hand when you're through reading. Turn to the next page. Begin.

[1. Continue with re-timing and re-reading as necessary up to a total of 5 readings. 2. If a child does not get 100% correct responses in 5 reading trials on a test, mark an F by the last time score, and then go on to the next test selection. 3. Complete all tests repeating appropriate sections above. 4. If student finishes the whole test before others do, give him a book to read or ask that he read the book he has brought with him.]

IMMEDIATE TRANSFER TESTING

The passages that you will read today have several paragraphs and are longer than the ones you read before. The passages may or may not contain statements of the Main Idea.

[FOLLOW THE SAME DIRECTIONS AS FOR THE POST TESTING.]

DELAYED TRANSFER TESTING

The passages that you will read today will be like those you read the last time we met. The passages may or may not contain statements of the Main Idea.

[FOLLOW THE SAME DIRECTIONS AS FOR THE POST TESTING.]

APPENDIX B

Orientation Materials

[See Appendix A for the context in which the folders were used.]

Materials used with Group I--Main Idea Stated.

Mr. Potts, la, folder 1.

Mr. Potts was getting ready for a trip. This morning Mr. Potts drove to the bank for extra money. On the way home he stopped to fill the gas tank. Next he packed two suitcases. He put the suitcases in the car.

Mr. Potts, la, folder 2.

This morning Mr. Potts drove to the bank for extra money. On the way home he stopped to fill the gas tank. Next he packed two suitcases. He put the suitcases in the car. Mr. Potts was getting ready for a trip.

Mr. Potts, la, folder 3.

This morning Mr. Potts drove to the bank for extra money. On the way home he stopped to fill the gas tank. Mr. Potts was getting ready for a trip. Next he packed two suitcases. He put the suitcases in the car.

Mr. Potts, la, folder 4.

On the way home he stopped to fill the gas tank. Mr. Potts was getting ready for a trip. He put the suitcases in the car. This morning Mr. Potts drove to the bank for extra money. Next he packed two suitcases.

The Diver, folder 1.

John was getting ready to go down to the sunken ship. Two men helped John put on his rubber diving suit. Next he put on his lead shoes. A heavy belt was put around his waist. The big steel helmet was put over his head.

The Diver, folder 2.

Two men helped John put on his rubber diving suit. Next he put on his lead shoes. John was getting ready to go down to the sunken ship. A heavy belt was put around his waist. The big steel helmet was put over his head.

Telephone Directory

Badger Cab Co.	256-5566
Baker Robert	238-1073
Barry Thomas	238-2425
Bates John	257-3598
Beck Paul	256-3438
Bell Sally	257-3808
Berg David	249-7397

The New Car.

Father bought a new car. He went to the Ford dealers and asked to see their latest model. He drove one of the cars around the block. He liked it. The price was reasonable. He took out his checkbook.

Materials used with Group II--Main Idea Unstated.

Mr. Potts, 1a.

This morning Mr. Potts drove to the bank for extra money. On the way home he stopped to fill the gas tank. Next he went to his room and packed two suitcases. He put the suitcases in the trunk of the car.

Multiple choice selections.

Mr. Potts packed two suitcases.

Mr. Potts filled the gas tank.

Mr. Potts was getting ready for a trip.

Mr. Potts went to the bank for money.

Mr. Potts put the suitcases in the car.

Mr. Potts, 1b.

One day Mr. Potts backed his old car out of the garage. He filled a large bucket full of water and special soap. He connected the hose and brought it close to the car. Then he took a sponge and dipped it into the bucket.

Multiple choice selections.

Mr. Potts dipped a sponge into the bucket.

Mr. Potts brought the hose close to the car.

Mr. Potts filled a bucket with water and soap.

Mr. Potts got ready to wash the car.

Mr. Potts backed his car out of the garage.

The Diver, folder 1.

Two diving experts on the boat helped John put on his rubber diving suit. Next they helped him put on his special lead shoes. A heavy belt was put around his waist. Last of all, the big steel helmet was put carefully over his head.

The Diver, folder 2.

A heavy belt was put around his waist. Next they helped him put on his special lead shoes. Two diving experts on the boat helped John put on his rubber diving suit. Last of all, the big steel helmet was put carefully over his head.

Telephone Directory.

Badger Cab Co.	256-5566
Baker Robert	238-1073
Barry Thomas	238-2425
Bates John	257-3598
Beck Paul	256-3438
Bell Sally	257-3808
Berg David	249-7397

The New Car.

Father went to the Ford dealers and asked to see their latest model. He drove one of the newest cars around the block. He liked the way it handled. The price was very reasonable. He took out his checkbook.

APPENDIX C

Samples of Differential Training Materials Used for Groups One and Two

57 / MI

E / D

Look at your watch. Do the hands point up?

You are to read this selection once for this purpose:

To find the most important or main idea.

Put a red X on the graph

to show how fast you plan to read this selection.

If you don't know a word, raise your hand and we will help you.

Remember, you are to read the selection once,

to find the most important or main idea.

Turn the page.

S

57 / MI

E / D

Start your watch.

Some animals can hear better than you. Moles spend most of their time underground trying to find insects and worms to eat. With their sharp ears they can hear the sounds of insects which you could not possibly hear. Dogs have sharp ears, too. They can hear the ticking of a watch forty feet away. You can hardly hear a watch ticking four feet away. This means that dogs can hear at least ten times as well as you!

Stop your watch.

Turn the page and follow directions.

57 / MI

E / D

The sentences below tell about what you have just read. The sentences are in a mixed-up order. You are to find the most important or main idea.

1. Look at the sentences below.
2. Mark one sentence with an X to show the main idea.

________ Moles can hear insects that you cannot hear.

________ Some animals can hear better than you.

________ Dogs can hear ten times as well as you.

________ Moles spend much time trying to find insects and worms.

________ Dogs can hear the ticking of a watch forty feet away.

________ You can hardly hear a watch ticking four feet away.

________ Dogs have sharp ears, too.

Record your time.

Look at your watch. Do the hands point up?

You are to read this selection once for this purpose:

To find the most important or main idea.

Put a red X on the graph

to show how fast you plan to read this selection.

If you don't know a word, raise your hand and we will help you.

Remember, you are to read the selection once,

to find the most important or main idea.

Turn the page.

Start your watch.

Moles spend most of their time underground trying to find insects and worms to eat. With their sharp ears they can hear the sounds of insects which you could not possibly hear. It is a well-known fact that dogs have very sharp ears, too. They can hear the ticking of a watch forty feet away. You can hardly hear a watch ticking four feet away. This means that dogs can hear at least ten times as well as you!

Stop your watch.

Turn the page and follow directions.

The sentences below tell about what you have just read. The sentences are in a mixed-up order. You are to find the most important or main idea.

1. Look at the sentences below.
2. Mark one sentence with an X to show the main idea.

_________Moles can hear insects that you cannot hear.

_________Some animals can hear better than you.

_________Dogs can hear ten times as well as you.

_________Moles spend much time trying to find insects and worms.

_________Dogs can hear the ticking of a watch forty feet away.

_________You can hardly hear a watch ticking four feet away.

_________Dogs have sharp ears, too.

Record your time.

APPENDIX D

Samples of Equivalent Sets of Materials for Transfer Testing

T / 1

MI / S

You are to read this selection once for this purpose:

to find the most important or main idea.

When you are through reading the selection once, you should raise your hand. Then you will be shown a list of sentences telling about the selection. These sentences will be in a mixed-up order. You will be asked to pick out the most important idea from this list and mark it with an X.

If you don't know a word, raise your hand and we will help you.

Remember, you are to read the selection once:

to find the most important or main idea.

Turn the page.

T / 1

MI / S

Start your watch.

Eagles stay with the same mate and nesting place for life. This is claimed for many birds, but usually it is false. The eagle pair do stick to each other, year in and year out, until death.

No other bird is so deeply attached to his home. The eagle never leaves his home skies, except to seek a mate, or when forced to find a better food supply. Most birds desert the nest at the end of one season. But each year the eagle builds a new nest on top of the old one. And an eagle may live as long as a man. So the nest grows and grows and serves as a permanent home, summer and winter.

One nest in a tree that blew down near Lake Erie was found to weigh nearly two tons. It had been used for perhaps a century. Another, found on a rock off the California coast, contained several wagonloads of sticks and leaves. Coarse branches sometimes six feet long formed the foundations of this bird castle. Within, it was lined with soft grasses, moss and feathers. The view from such a wilderness mansion is the grandest in the countryside.

Stop your watch.

Raise your hand.

Do not re-read.

Rewritten from: Reader's Digest, Reading Skill Builder, G-6, P-2, 52

T / 1

MI / S

The sentences below tell about what you have just read. The sentences are in a mixed-up order. You are to find the most important or main idea.

1. Look at the six sentences below.
2. Mark one sentence with an X to show the main idea.

________ Eagles mate for life.

________ Eagles stay with the same mate and nesting place for life.

________ An eagle's nest may be used for a hundred years.

________ Each year the eagle builds a new nest on top of the old one.

________ Of all birds the eagle is most deeply attached to his home.

________ An an eagle's nest grows and grows, it serves as a permanent home.

Raise your hand.

DT / 2

MI / S

You are to read this selection once for this purpose:

to find the most important or main idea.

When you are through reading the selection once, you should raise your hand. Then you will be shown a list of sentences telling about the selection. These sentences will be in a mixed-up order. You will be asked to pick out the most important idea from this list and mark it with an X.

If you don't know a word, raise your hand and we will help you.

Remember, you are to read the selection once:

to find the most important or main idea.

Turn the page.

DT / 2

MI / S

Start your watch.

All eagles are very small when hatched. Since they have so much more to learn than most birds, their education is long. At first the chicks get food popped into their mouths. But when they should begin to feed themselves, the parents tear up a fish before the youngsters' eyes to show them how to do it. Presently they bring a whole fish and stand back while the little fellows learn to divide it themselves.

Just as children play with toys, eaglets in their nest play with sticks and learn to grasp objects with their claws. Before they can fly, they must first pluck out their gray down and smooth their new, strong, white feathers. They are taught to exercise every day. Their parents show them how to jump up and down on the large platform of the nest, flapping their wings. They do this by the hour, squealing and stamping like children in a game. All this is to get ready for flying. At last the young eagles make a first, terrified flutter from the edge of the nest. To fly as an eagle flies, it seems, is something that is learned only by weeks of practice.

Stop your watch.

Raise your hand.

Do not re-read.

Rewritten from: Reader's Digest, Reading Skill Builder, G-6, P-2, 52-3.

DT / 2

MI / S

The sentences below tell about what you have just read. The sentences are in a mixed-up order. You are to find the most important or main idea.

1. Look at the six sentences below.
2. Mark one sentence with an X to show the main idea.

________ Eaglets must do several things to get ready for flying.

________ Eaglets' education is long for they have much to learn.

________ Eaglets are taught to exercise every day.

________ Eaglets play somewhat like children.

________ Baby eagles learn to divide their food.

________ The eagle must practice for weeks to be able to fly.

Raise your hand.

REFERENCES

1. Greenhouse, Samuel W., and Geisser, Seymour. "On Methods in the Analysis of Profile Data," Psychometrika. XXIV (June 1959), 95-111.

2. Harris, Theodore L., Herrick, Virgil E., Macdonald, James B., and Rarick, G. Lawrence. Experimental Development of Variability in Reading Rate in Grades 4, 5, and 6. Madison: Committee for Research in Basic Skills, School of Education, The University of Wisconsin, 1965.

3. Harris, Theodore L., and Rarick, G. Lawrence. "Problem of Pressure in Handwriting," Journal of Experimental Education, XXVI (December 1957), 151-78.

4. Herrick, Virgil E., Harris, Theodore L., and Rarick, G. Lawrence. Perception of Symbols in Skill Learning by Mentally Retarded, Gifted, and Normal Children. Madison: Committee For Research in Basic Skills, School of Education, The University of Wisconsin, 1961.

5. Herrick, Virgil E., and Otto, Wayne. "Pressure On Point and Barrel of a Writing Instrument," Journal of Experimental Education. XXX (December 1961), 215-30.

6. Otto, Wayne. "The Acquisition and Retention of Paired Associates by Good, Average, and Poor Readers," Journal of Educational Psychology, LII (October 1961), 241-8.

7. Scheffé, H. A. "A Method for Judging All Possible Contrasts in the Analysis of Variance," Biometrika, 1953, 40, 87-104.

8. Scheffé, H. A. The Analysis of Variance. New York: John Wiley & Sons, Inc., 1960.

9. Shores, Harlan J. "Reading Science Materials for Two Distinct Purposes," Elementary English, XXXVII (December 1960), 546-62.